

Size with the Originals. One is cut on a Beam running from the North-East Corner of the Steeple to the School in the Church of *Ashford* in *Kent*, and expresses the Year 1295 (*a*). The other is cut in a Beam (over a great Passage) that is Part of a very old House at *Cambridge*, called the *Half-Moon*, near *Magdalen-College*, and denotes the Year 1332 (*b*). The Figures of both are very rude, agreeable to those Times, being the oldest I have yet met with, except those at *Helmdon* (*c*).

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II. *A Letter from the Rev. Mr. Joseph Betts, M. A. and Fellow of University College, Oxon. to Martin Folkes, Esq; Pr. R. S. containing Observations on the late Comet, made at Sherborn and Oxford; with the Elements for computing its Motions.*

Read June 14.  
1744.

THE Comet which appeared towards the End of last *December*, and in the following Months *January* and *February*, 1744. was first seen in *England*, at the Observatory of the Right Honourable the Earl of *Macclesfield*, *Dec. 23.* between 5 and 6 o' Clock in the Evening. It formed, at that time, an obtuse-angled Triangle, with ( $\alpha$ ) of *Andromeda*, and ( $\gamma$ ) *Pegasi*, the Comet being at the

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(*a*) See TAB. Figure III. (*b*) See TAB. Figure IV. (*c*) See Philos. Transact. n. 439.

obtuse

obtuse Angle; and its Passage over the Meridian was observed at  $5^h 32'$ , mean *Oxford* Time. His Lordship's Observer could not then take its Distance from the *Vertex* accurately, the Comet's *Transit* being unexpected; however, by an Observation made at *Paris* the same Evening by Mr. *Monnier* we have the Distance very nearly.

His Lordship the next Day acquainting the Reverend Mr. Professor *Bliss* with this Discovery, gave us an Opportunity of looking after it at *Oxford*; but, unfortunately, bad Weather, and a continued Succession of cloudy Evenings prevented our observing it, till *Dec.* 31. but the Weather proving more favourable at *Sherborn*, its right Ascensions and Declinations were taken by his Lordship, the Result of which Observations is as follows :

*Note*, That the equal Time is made use of in the following Observations, and that the Comet's *Transits* (reduced to the Meridian of *Oxford*) are only given to the nearest Half-Minute, as being sufficient for computing its Places.

*Dec.* 23<sup>d</sup>  $5^h 32'$ ) The right Ascension of the Comet by the *Transit* Instrument at *Sherborn* was found to be  $5^{\circ} 48' 1''$ ; and its Polar Distance by Mr. *Monnier*  $68^{\circ} 18' 35''$ .

*Dec.* 27<sup>d</sup>  $5^h 7\frac{1}{2}'$ ) The right Ascension of the Comet, observed at *Sherborn*, was  $3^{\circ} 41' 7''$ ; and its Declination  $21^{\circ} 7' 13''$  North.

*Dec.* 28<sup>d</sup>  $5^h 1\frac{1}{2}'$ ) The observed right Ascension of the Comet was  $3^{\circ} 11' 8''$ ; and its Distance from the Pole  $69^{\circ} 0' 38''$ .

*Dec.*

but that it transmits the Colour of the Blood ; which is, at such times, more forcibly driven into the capillary subcutaneous Vessels, and shines thro' the *Epidermis* ; but, before, these Vessels contained only a serous Liquor, and, accordingly, the Skin appeared of that Colour : Which will further appear upon squeezing such red Parts, which drives the Blood out of them, and makes them appear white ; whereas, on removing such Pressure, they recover their Colour, as the Blood does its Place. 3. The yellow Colour of the Skin in the Jaundice is a further Proof of this Assertion ; where the yellow Bile is diffused thro' the Vessels of the *Cutis*, and appears thro' the *Epidermis* ; but no one will imagine, that the *Epidermis* itself receives this viscid Bile into its Vessels ; which are so small, that many accurate Anatomists, as *Morgagni*, have denied it to have any Vessels at all ; and the most accurate could never shew them. 4. The pale Look of those, in whom the Blood is viscid, or circulates with little Force, shews, that the *Epidermis* then transmits the Colour of the Juices and Fibres below it, which are then unmix'd with red Blood. 5. The same is manifest in those whose Blood is poor and serous, as the Leucophlegmatic, &c. in whom the *Epidermis* transmits the Colour of the Water or Serum under it.

From hence it appears, that the *Epidermis* is a transparent Membrane, which easily shews the Colour of the Parts under it, in the same manner as the *Cornea* of the Eye transmits the Colour of the *Iris*. But this will appear more plainly, from some Considerations below ; where we shall assign the Cause of this Pellucidity ; and shew, that the Numbers of

Star  $1^{\circ} 13' 24''$ . Hence the Comet's right Ascension was  $355^{\circ} 2' 36''$ ; and its Declination  $18^{\circ} 55' 19''$  North.

*January* 23<sup>d</sup> 6<sup>h</sup> 11') The Comet's Distance was observed by the Quadrant from *Aldebaran*  $69^{\circ} 26' \frac{2}{3}$ ; corrected for Refraction  $69^{\circ} 28' 5''$ ; from ( $\gamma$ ) *Pegasi*  $8^{\circ} 42' \frac{1}{4}$ ; corrected  $8^{\circ} 42' 35''$ .

*January* 23<sup>d</sup> 7<sup>h</sup> 29') The Comet preceded ( $\phi$ ) *Pegasi*  $2^{\circ} 43' 27''$  in right Ascension; and was North of the Star, in the 8 Foot Glass,  $26' 32''$ . Hence the Comet's right Ascension was  $352^{\circ} 8' 46''$ ; and its Declination  $18^{\circ} 8' 27''$ .

The Comet this Evening appeared exceedingly bright and distinct, and the Diameter of its *Nucleus* nearly equal to that of *Jupiter's*; its Tail, extending above 16 Degrees from its Body, pointed towards ( $\zeta$ ) of *Andromeda*; and was in Length (supposing the Sun's Parallax  $10''$ ) above 23 Millions of Miles; but cloudy Weather succeeding, we lost this agreeable Sight till *Feb.* 5<sup>th</sup>.

*Feb.* 5<sup>d</sup> 7<sup>h</sup> 31'  $\frac{1}{2}$ ) A small Star of *Pegasus*, marked ( $\alpha$ ) by *Bayer*, preceded the Comet in right Ascension  $1^{\circ} 40' 20''$ ; and was South of the Star  $54' 23''$ : The right Ascension of the Star, by the *Greenwich* Observations at that time, was  $343^{\circ} 0' 4''$ ; its Declination  $13^{\circ} 49' 56''$ : Wherefore the Comet's right Ascension was  $344^{\circ} 40' 24''$ ; and its Declination  $14^{\circ} 44' 19''$  North.

*Feb.* 11<sup>d</sup> 6<sup>h</sup> 37'  $\frac{1}{2}$ ) The Comet followed ( $\xi$ ) *Pegasi*; the Correction for Refraction being allowed  $43' 1''$  in right Ascension; and was South of the Star  $50' 3''$ : The right Ascension of ( $\xi$ ), by the *Greenwich* Observations at that time, was  $338^{\circ} 28' 24''$ ; its

its Declination  $10^{\circ} 51' 3''$ : Therefore the Comet's right Ascension was  $339^{\circ} 11' 25''$ ; and its Declination  $10^{\circ} 1'$  North.

*Feb. 12<sup>d</sup> 6<sup>h</sup> 33')* The Comet followed ( $\zeta$ ) *Pegasi*  $56' 45''$  of right Ascension; and was more southerly than the Star  $44' 42''$ . The right Ascension of ( $\zeta$ ), by the *Greenwich* Observations at that time, was  $337^{\circ} 10' 15''$ ; its polar Distance  $80^{\circ} 29' 53''$ . Hence the Comet's right Ascension was  $338^{\circ} 7' 00''$ ; and its Declination  $8^{\circ} 45' 25''$  North.

*Feb. 13<sup>d</sup> 6<sup>h</sup> 25')* The Comet preceded ( $\rho$ ) *Pegasi*  $7^{\circ} 41' 31''$  in right Ascension; and was more southerly than the Star  $1' 13''$ : The right Ascension of the Star, at that time, was  $344^{\circ} 41' 55''$ ; its Polar Distance  $82^{\circ} 40'$ : Whence the right Ascension of the Comet was  $337^{\circ} 0' 24''$ ; and its Declination  $7^{\circ} 18' 47''$  North.

This was the last Observation made at *Oxford*; the Comet being now so near the Sun, and withal so low in the Evening, that the great Difficulty of finding any Star to compare it with, made us desist from attempting it again; however, the prodigious Brightness it acquired, by its near Approach to the Sun, made it visible in the Day-time. And at *Sherborn*,

*Feb. 16<sup>d</sup> 23<sup>h</sup> 42'<sup>1</sup>/<sub>2</sub>)* Its right Ascension, by the *Transit* Instrument, was found to be  $333^{\circ} 13' 53''$ ; and its Declination  $0^{\circ} 2' 40''$  South.

*Feb. 17<sup>d</sup> 23<sup>h</sup> 36')* The right Ascension was observed  $332^{\circ} 33' 20''$ ; and its Declination  $2^{\circ} 29' 00''$ .

By the Help of these Observations, which were made by the Rev. Mr. Professor *Bliss* (the *Transits* excepted taken at *Sherborn*), I was enabled, by the Method delivered in the third Book of the

*Principia*, to determine the Comet's Parabolic Trajectory ; and found the Place of the ascending Node to be in  $8. 15^{\circ} 45' 20''$  ; The Logarithm of the *Perihelion* Distance 9,346472 : The Logarithm of the diurnal Motion 0,940420 : The Place of the *Perihelion*  $\approx. 17^{\circ} 12' 55''$  ; the Distance of the *Perihelion* from the Node  $151^{\circ} 27' 35''$  : The Logarithm, Sine, and Co-sine of the Inclination of the Orbit to the Ecliptic 9,865138, 9,832616 : And thence the Time the Comet was in the *Vertex* of the *Parabola*, or the Time of the *Perihelion*, Feb. 19<sup>d</sup> 8<sup>h</sup> 12' : The Motion of the Comet, in its Orbit thus situated, was direct, or according to the Order of the Signs.

From these Elements, by the Help of Dr. *Halley's* general Table (to which they are adapted), I computed the Comet's Places for the Times of Observation, exhibited in the following Table: To which are added the Comet's Longitudes and Latitudes deduced from the observed right Ascensions and Declinations; together with the Errors between the observed and computed Places; the Observations being all reduced to *Oxford* mean Time.

Equal Time at <i>Oxford.</i>			Longit. Comet observed.			North Latit. observed.			Longit. Comet computed.			North Latit. computed.			Diff. in Long.		Diff. in Latit.	
D	H	'	°	'	"	°	'	"	°	'	"	°	'	"	"	"	"	"
<i>Dec.</i>																		
23	5	32	W.	14	10	2	17	33	11	W.	14	10	3	17	33	37	1—	26—
27	5	7 $\frac{1}{2}$	W.	12	2	25	17	51	29	W.	12	2	26	17	51	47	1—	18—
28	5	1 $\frac{1}{2}$	W.	11	32	11	17	55	54	W.	11	32	14	17	56	8	3—	14—
31	4	44	W.	10	4	57	18	9	3	W.	10	5	16	18	8	53	19—	10+
5	53		W.	10	4	11	18	9	37	W.	10	3	55	18	9	6	16+	31+
<i>Jan.</i>																		
12	9	10	W.	4	52	5	18	59	37	W.	4	52	24	18	59	13	19—	24+
13	6	20	W.	4	31	40	19	2	31	W.	4	31	13	19	2	49	27+	18—
16	8	20	W.	4	29	27	19	3	32	W.	4	26	6	19	3	12	21+	20+
23	6	33	W.	3	18	43	19	15	47	W.	3	18	27	19	15	13	16+	34+
23	8	00	W.	3	17	31	19	16	7	W.	3	17	00	19	15	30	31+	37+
23	6	11	W.	0	19	45	19	42	30	W.	0	19	16	19	42	1	29+	29+
23	7	29	W.	0	17	58	19	42	47	W.	0	17	45	19	42	12	13+	35+
<i>Feb.</i>																		
5	7	31 $\frac{1}{2}$	W.	21	52	37	19	35	00	W.	21	52	56	19	34	42	19—	18+
11	6	37 $\frac{1}{2}$	W.	14	42	45	17	23	30	W.	14	42	58	17	24	5	13—	35—
12	6	33	W.	13	10	56	16	38	40	W.	13	10	52	16	39	17	16—	37—
13	6	25	W.	11	32	50	15	43	45	W.	11	33	16	15	44	16	26—	31—
16	23	41 $\frac{1}{2}$	W.	5	9	14	10	17	40	W.	5	9	1	10	18	8	13+	28—
17	23	35	W.	3	37	37	8	15	39	W.	3	37	11	8	16	3	26+	24—

Perhaps it may not be thought foreign to my Purpose to remark, that the Nodes of the Comet, and the Planet *Mercury*, are situated within less than half a Degree of each other; which, I suppose, gave Rise to a Report, that the Comet had carried *Mercury* from its Orbit. In order therefore to find how nearly they approached each other, I had the Curiosity to bring the Matter to Calculation; and presently found, there was above a Week's Difference in the Times of their Coming to the Nodes; the Comet passing its descending Node, *Feb.* 22. about 2<sup>h</sup> in the Morning; and *Mercury* not coming to his till *Feb.* 29. the Comet moving all that Time Southwards with a prodigious Velocity. Again, computing their Helio-centric Conjunction, which happened *Feb.* 18. about 1<sup>h</sup> in the Afternoon, I found the Comet was, at that time, distant from *Mercury* nearly  $\frac{1}{2}$  Part of the Semi-diameter of the *Orbis magnus*; being almost twice as near to the Sun as the Planet  $\varphi$ ; and having then 31° 30' of North Latitude; *Mercury's* not exceeding 3° 58' (to an Eye in the Sun): Whence it is easily collected, that the Comet could have no sensible Influence upon  $\varphi$ 's Motion.

I shall now only beg Leave to observe, that the Elements above-given cannot possibly differ much from the true. For, after an Interval of Two Months (in which time the Comet had gone thro' almost  $\frac{1}{3}$  Part of its Orbit), it is surprising to find the observed and computed Places agree so accurately, that the Difference no-where amounts to a Minute. In some Parts of the Orbit, the Agreement is still greater; particularly, in the Observations made at *Sherborn*, which come within half that Quantity; and would have



have corresponded still nearer, but that I was ambitious to confine the whole Series of Observations within the narrow Limit above-mentioned; which I have at last compassed, not without a long and tedious Calculation: But, long and tedious as it was, I shall not repent of the Trouble I have been at, if I find my Endeavours agreeable to my astronomical Reader.

It may, perhaps, be expected (considering the great Part of its Orbit the Comet described during its Appearance), that I should have settled its Period, and foretold its Return. ---- This, I confess, would have given me great Pleasure; neither would I have spared any Pains in the Inquiry, had I met with any Prospect of Success; but the Period, upon my attempting it at first, came out so prodigiously long (the transverse Ax of the Ellipse being nearly equal to Infinity), that I was stopp'd short in my Inquiry; neither could I prevail upon myself to resume the Subject again, when, upon turning over *Hevelius*, I found the Account of Comets, which had appeared at long Intervals of Time from us (as it might reasonably be expected) so short and uncertain: But, could I procure *Celsius's* Observations, or any made after the *Perihelion*, I might be induced to fall to Work again; and would not fail communicating the Result, did I meet with Success; and, at the same time, the Elements of the Comet, which appeared in 1742, which I have had by me some time; not so perfect as I could wish, but as perfect as may be obtained from the few Observations I met with.

The Comet was in Conjunction with the Sun, *Feb.* 15. about Midnight; and its Perigee, *Feb.* 16.  
about

about 1<sup>h</sup> in the Afternoon ; at which time it was somewhat nearer the Earth than the Sun is at its Perigee ; the Comet's Distance being then (,83) and the Sun's (,98) such Parts, as the Semidiameter of the *Magnus Orbis* is (,100) ; from which we may have some Idea of the Comet's Magnitude ; and therefore may suppose it, at least, equal to the Earth.

Joseph Betts.

III. *Observatio de Scirrho Cerebelli, ab Alberto Hallero, R. S. S. Archiat. Reg. & Med. Prof. Gotting. ad Reg. Soc. transmissa.*

Read June 14.  
1744.

**C**erebellum sedem principii vitalis fecit *Willisius* ; et, qui hanc hypothesein ornatissime proposuit, *Boerhaavius*. Verum, præter plurima, quæ contra nervorum vitalium distinctam classim faciunt, et præter experimenta capta à cl. *Lapeyronie*, per quæ constat vulnera cerebelli inflicta canibus, non continuo lethalia fuisse, hanc etiam hypothesein infirmant morbi cerebelli, satis rari, sed aliqui tamen, etiam maximi, et qui cerebellum pene inutile redderent, qui ætatem tamen tulerunt. Manifesta certe inde nascitur suspicio, non adeo, ut *Willisiana* requireret hypothesis, proximam vitalium cordis nervorum, in cerebello & solo, originem esse. Quos præterea satis constat, minima parte à cerebri nervi octavi, et intercostalis ramis, sed à spinalibus imprimis provenire, ex quibus, utrumque ganglion cervicale, multo magis, quam à cerebri propagine, provenit.

Ergo